

Date: Fri, 25 Mar 94 04:30:29 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #72
To: Ham-Homebrew

Ham-Homebrew Digest Fri, 25 Mar 94 Volume 94 : Issue 72

Today's Topics:

 2m linear using a pair of 4CX100A's- Help!!!
 advice fm (2 msgs)
 Component Databooks ?
Kenwood (TS-850) Computer Interface Info Wanted (2 msgs)
 Noise figure/transistors
 QSKing an AMP
 Simple Tx/Rx?
 What is third order intercept ?

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: 24 Mar 1994 07:51:32 -0600
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!cs.utexas.edu!
not-for-mail@network.ucsd.edu
Subject: 2m linear using a pair of 4CX100A's- Help!!!
To: ham-homebrew@ucsd.edu

A friend and I got a couple of new Eimac 4CX1000A's cheaply, and decided to
design a linear amp for 2m around them. For those who don't know the 4CX1000A,
it's a 1000W, class AB1 only tetrode, designed for use to 110MHz, but many designs
exist for use at 144MHz. Max current is 1A, max voltage is 3kV.

The amplifier is *supposed* to be push-pull, but I'm not sure that they are,
since the amplifier works rather poorly. Any suggestions would be appreciated. It
was believed to be *almost finished* about two years ago, but has never worked
properly.

Because of the cost of the bases, I fabricated a couple from brass and PTFE. To avoid having to make screen decoupling capacitors, the amplifier runs in grounded screen, similar to the design using a single tube in the ARRL manual. Hence:

Screen voltage 0V wrt earth
Cathode voltage -325V wrt earth
Grid Voltage -385V wrt earth
Anode voltage +2700V wrt earth

This gives the required 60V between cathode and grid and 325V between screen and cathode. Standing current is 250mA per valve (if my memory serves me correctly, since I haven't 'played' with it for a long time.)

DC conditions seem okay, and the amplifier seems stable, with no hint of output with no drive, no matter where the tuning knobs are. It is not neutrilised.

Applying RF drive, results in in output of about 100W, before the tubes start to draw grid current. Since the grid dissipation of these tubes is zero, it would not be safe (or linear) to run more output power than this. I have pushed the tubes to draw about 1mA of grid current each, where the output rises sharply, to about 600W. Since we were hoping for about 3200W output power, we clearly have some way to go!!!

The power supply is designed so that it is possible to cut one valve off, so that the standing current of each valve can be set precisely equal by slight adjustment of the individual grid voltage. Cutting one valve off, then applying drive, again gives at most a few hundred Watts from one tube.

One thing that has always bothered me, is that it is *poossible* that the tubes are being driven in push-pull (as I want), but the anode circuit is functioing in parallel (or visa-versa). Is there an easy way to check?? However, the fact it works poorly on one tube, with the other cut off, suggests this is not the problem.

The grids are two half-wave lines. The anode is a 'U' shaped arrangement, with quarter wave lines. The Valves are at the ends, and HT fed to the centre. The output was supposed to be link coupled, much like many amps using twin 4CX250B's.

I've virtually given up. Its cost nearly \$2000 to build, but produces less output than a 4CX250B!! I can't see any way of getting it going properly. Any ideas??????????

By the way, we have a decent power meter and 3kW oil cooled load.

dave kirkby, G8WRB

Date: 24 Mar 1994 10:26:02 +0200
From: ihnp4.ucsd.edu!munnari.oz.au!hippo.ru.ac.za!nntp.und.ac.za!cs.uct.ac.za!
cs.uct.ac.za!news@network.ucsd.edu
Subject: advice fm
To: ham-homebrew@ucsd.edu

Hi Everyone.

I'm looking for advice from someone knowledgable in radio and electronics.
A normal f.m radio recieves up to about 108 Mhz.
Does anyone know how to adjust it to recieve from 108 to about 130 Mhz?
These are the aircraft frequencies and it'd be cool to listen in. I've
heard that it's quite a simple operation involving a small adjustment in
any cheap f.m reciever.
Any advice is very welcome. Remember I'm a very non-specialist audience
here, so please keep it simple.
I'd appreciate mail in this regard.
Thanks-

-- Ari Cotton.

Date: Thu, 24 Mar 1994 23:32:35 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!utnut!utcsri!newsflash.concordia.ca!
CC.UMontreal.CA!poly-vlsi!nick@network.ucsd.edu
Subject: advice fm
To: ham-homebrew@ucsd.edu

In article <2mriqq\$a0l@cs.uct.ac.za> acotton@cs.uct.ac.za (A Cotton) writes:
>Hi Everyone.
>
...stuff deleted...

>These are the aircraft frequencies and it'd be cool to listen in. I've
>heard that it's quite a simple operation involving a small adjustment in
>any cheap f.m reciever.
>Any advice is very welcome. Remember I'm a very non-specialist audience
>here, so please keep it simple.

Ok, Ari, here's simple, it will be tough to listen to the aircraft band
on an FM receiver...mainly because they use AM (airplane mode). You'll
need to get a VHF AM receiver if you want to listen to the tower...

Nick

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*****
*      Nick Ciarallo                                     *
*      SR Telecom Inc.          telephone: 514-335-2429  ex: 438      *
*      Microwave Group         facsimile: 514-334-7783          *
*      8150 Trans Canada Hwy    internet : nick@vlsi.polymtl.ca      *
*      St. Laurent, Quebec      hamradio : ve2hot@ve2fkb.pq.can.na    *
*      Canada H4S-1M5                                           *
*****
*      Accept no substitutes, *REAL* ham radio lives on 220 MHz!      *
*****

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Date: 24 Mar 1994 10:34:38 GMT
 From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!pipex!sunic!
 news.funet.fi!network.cc.jyu.fi!spt.fi!J.Pelt@network.ucsd.edu
 Subject: Component Databooks ?
 To: ham-homebrew@ucsd.edu

HI !

I got recently a databook (Motorola.exe). And I think
 that it is really good. Would somebody tell me
 if there is other databooks in "computer format"
 available from other manufacturers ??

Is there FTP server somewhere, where i can get those files ?

Thank you es 73 !

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Jukka Peltomaki          J.Pelt@spt.fi
Kaskenmaentie 139        HAM RADIO: OH1NVL
38770 LOHIKKO
Finland, Europe

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Date: 24 Mar 94 15:25:45 GMT
 From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!vixen.cso.uiuc.edu!aries!
 hawley@network.ucsd.edu
 Subject: Kenwood (TS-850) Computer Interface Info Wanted
 To: ham-homebrew@ucsd.edu

adam@panix.com (Adam Epstein) writes:

> A friend is interested in getting details about the computer
>interface "box" used with the Kenwood TS-850. Has anybody built one
>for themselves (rather than buying Kenwood's)? Does anybody have
>schematics? I'm sure that recommendations of commercially available
>software and other hints and kinks would be appreciated as well.
>Email to me (adam@panix.com) and I'll forward your replies.

> -Thanx

> -Adam (N2DHH)

The box is just opto isolators on the signal lines driven by and driving
ttl to line driver level converters (5v to +/-10v). Look thru QST for an
article.....it'll probably cost about the same if you do it right.
Chuck Hawley KE9UW.

Date: Thu, 24 Mar 1994 15:59:47 GMT
From: ihnp4.ucsd.edu!pacbell.com!att-out!nntp!not-for-mail@network.ucsd.edu
Subject: Kenwood (TS-850) Computer Interface Info Wanted
To: ham-homebrew@ucsd.edu

In article <hawley.764522745@aries>,
Chuck Hawley <hawley@aries.scs.uiuc.edu> wrote:
>adam@panix.com (Adam Epstein) writes:

>

>

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>>interface "box" used with the Kenwood TS-850. Has anybody built one
>>for themselves (rather than buying Kenwood's)? Does anybody have
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>ttl to line driver level converters (5v to +/-10v). Look thru QST for an
>article.....it'll probably cost about the same if you do it right.
>Chuck Hawley KE9UW.

>

Check out my article in Feb. 93 QST "Everything You Always Wanted To Know
About Computer-Controlling Modern Radios" (I didn't pick the title :). It
has plans for a Kenwood interface that is opto-isolated and implements the
handshaking lines as well as the data for complete compatibility.

I also still offer the parts kits listed at the end of the article. Prices
are the same, (\$47 for Kenwood kit, \$44 for Icom/Yaesu/Ten-Tec) but the

address is now:

CW Technology
7328 Timbercreek Court
Reynoldsburg, OH 43068-1181

COD Orders Only (add \$5) at 800-547-7479

The kits include PCB and all board mounted parts. You provide case and 8-15V supply.

NOTE: ARRL has the PCB layouts and the parts are readily available - you do not have to buy anything from me.

E-mail if you need more info

--

Wally Blackburn Clinton-Gore - Socialist Leadership
wrb@ccsitn.cb.att.com for the 90s!
Amateur Radio Station AA8DX I'm the NRA.
More people have died in Ted Kennedy's car than from my gun!

Date: Fri, 25 Mar 1994 06:37:16 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!newsserver.jvnc.net!
raffles.technet.sg!ntuix!ntuvax.ntu.ac.sg!asirene@network.ucsd.edu
Subject: Noise figure/transistors
To: ham-homebrew@ucsd.edu

Hi,

Here's a design question. I am looking at the front-end RF amp which uses a 2N3904 and asking myself if I were to replace this with a transistor with a lower noise figure, say a 2N5179 or BF689, will I see any improvement? Is this mod worth pursuing? How much improvement can I expect to see here?

Tks.

Daniel

Date: Thu, 24 Mar 94 08:33:39 MST
From: ihnp4.ucsd.edu!sdd.hp.com!news.cs.indiana.edu!lynx.unm.edu!dns1.NMSU.Edu!
dns1.NMSU.Edu!usenet@network.ucsd.edu
Subject: QSKing an AMP

To: ham-homebrew@ucsd.edu

On Fri, 18 Mar 1994 20:02:00 GMT, Kenneth L Florence wrote:

>Hi all, I hv a Heath SB1000 (Ameritron AL80A), that I wud like to add QSK to.
>All the QSK kits are a bit expensive for my taste, but I was wondering. Is it
>just the speed of the internal relay that keeps this thing from being QSK?
Afterreading Richard Measure's (SP?) article in QST, if I just replace the
internal
>relay with a high speed vacum relay (Jennings) will I be able to run it in QSK
>or are there other restraints. Tnks for any help you can give.
>
>DE KA3PLS
You can qsk with the jennings relays but you need some control circuits to
prevent hot switching. If you find a diagram of an old alpha 77 that is
exactly the scheme they used. 73 Bill AA5ZQ

Date: Thu, 24 Mar 1994 18:03:21 GMT
From: rit!sunsrvr6!jdc@cs.rochester.edu
Subject: Simple Tx/Rx?
To: ham-homebrew@ucsd.edu

Greg Segallis (gsegalli@ic1d.harris.com) wrote:

: I want to build an RF remote shutter release for a camera.
: I need a max range of about 50' and
: it would be nice to have the receiver fairly insensitive to
: unwanted noise.

: I have seen several designs for simple transmitters (CW, tone
: transmitters, etc.) They are simple (just a few parts, with
: coils I can wind myself), small and cheap to build. They seem
: to have adequate power for this application.

: What I havn't seen is a simple receiver circuit.

If you only need one (as opposed to manufacturing thousands), try
a radio-controlled car transmitter/receiver/servo. I use one for
kite aireal photography, and it works well. You only need one
servo, so a 2-channel radio is more than enough. Look for ads in RC
car/airplane magazines. Or better yet, buy a used RC car, and head
down to the local hobby store for one extra servo. The extra servo
goes on the camera, and you can move the receiver between the
car and camera. Twice the fun for your money...

Jim

Date: Thu, 24 Mar 1994 07:57:09 GMT
From: ihnp4.ucsd.edu!galaxy.ucr.edu!library.ucla.edu!europa.eng.gtefsd.com!gatech!
swrinde!cs.utexas.edu!csc.ti.com!tilde.csc.ti.com!mksol!blair@network.ucsd.edu
Subject: What is third order intercept ?
To: ham-homebrew@ucsd.edu

Ronald Viegelaahn (ron@etch-eshop.Berkeley.EDU) wrote:

: Hi,

: I keep hearing the term " third order intercept " when speaking
: of frontend intermod problems.

To further enhance your confusion... The voltage out vs voltage
in 'transfer curve' can be modelled fairly well with a power
series:

$V_{out} = A_1 V_{in} + A_2 V_{in}^2 + A_3 V_{in}^3 + \dots$

Ideally, $A_2, A_3, A_4, \dots = 0$ and A_1 is just the gain. But in
reality A_3 is large enough that if you input 2 tones they
will beat against eachother and you'll wind up with 4 tones.

If you dig out a table of trig identities and substitute
 $V_1 \cos(2\pi f_1 t) + V_2 \cos(2\pi f_2 t)$ in for V_{in} you'll

see the terms $2f_1 - f_2$ and $2f_2 - f_1$ fall out. Other tones
fall out too, like the 3rd harmonics, but these are usually

out of band. If V_1 & V_2 are large enough the 5th order
terms $3f_1 - 2f_2$ & $3f_2 - 2f_1$ will pop up too and you'll have

2 more spurs show up. Usually the even order
terms are insignificant since most linearities are symmetric
and the spurs they produce fall out of band.

3rd order 2 tone spurs usually are the limiting factor in dynamic
range calculations and are the bane of RF engineers.

spuriously,

Art.

End of Ham-Homebrew Digest V94 #72
